

Prison inmates' susceptibility to false memory creation in the DRM paradigm

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Table of contents

Abstract	3
Introduction	4
The DRM paradigm	5
Research investigating individual differences and false memory creation	6
The mental health of inmates	9
The present study	12
Method	13
Participants	13
Deese-Roediger-McDermott (DRM) paradigm	14
Instruments	14
Research ethics and recruitment	16
Procedure	17
Results	18
False memories	18
Correlations	19
Discussion	20
False memory creation and depression, anxiety, dissociation, and fantasy proneness	21
Depression, anxiety, dissociation, and fantasy proneness in the group of inmates and the control group	22
Limitations of the present study	23
Implications for future research	24
References	26
Appendixes	i

Abstract

A growing amount of research has investigated false memory creation in various populations and in relation to a number of variables, such as personality traits and mental health variables. These studies have revealed inconsistent results, indicating that further research is needed. Apparently, no studies have to this date explored false memory creation in prison inmates. This is a rather distinct group considering the environment in which they live and their probably rather idiosyncratic histories. Gaining knowledge about this group's memory performances would be both interesting and fruitful for theoretical and practical reasons. In the present study, false recognition of the critical lure in the DRM paradigm was examined among 24 inmates in a Norwegian prison and preventive institution. In addition, Beck Depression Inventory (BDI-II), Beck Anxiety Inventory (BAI), Dissociative Experiences Scale (DES), and the Creative Experiences Questionnaire (CEQ) were completed by the participants. The group of inmates was compared with 24 control participants with regards to false recognition and the self-report measures. Furthermore, the relationship between false memories of the critical lure and depression, anxiety, dissociation, and fantasy proneness were addressed. The results revealed that the control participants falsely recognized significantly more of the critical lures than the group of inmates. Moreover, the inmates scored significantly higher on depression, dissociation, and fantasy proneness compared to the control group. With regards to the relationship between false memories of the critical lure and the self-report measures, no significant correlations were found. The present findings are discussed in relation to previous studies addressing depression, anxiety, dissociation, and fantasy proneness in prison inmates. Furthermore, they are discussed in relation to previous studies investigating the relationship between false memory creation and these individual differences. Finally, implications for future research are discussed.

Introduction

A growing body of research has investigated the influence of different variables on the creation of false memories. Researchers have investigated false memories in a number of populations, such as children (e.g. Bruck, Ceci, Francoeur, & Barr, 1995; Drummey & Newcombe, 2002; Robinson & Whitcombe, 2003; Rudy & Goodman, 1991; Shapiro & Purdy, 2005), eyewitnesses (e.g., Belli, Lindsay, Gales, & McCarthy, 1994; Johnson, Hashtroudi, & Lindsay, 1993; Multhaup, De Leonardis, & Johnson, 1999), and women with a previous history of child sexual abuse (e.g. Goodman, Ghatti, Quas, Edelstein, Alexander, Redlich, Cordon, & Jones, 2003; Williams, 1994). Furthermore, the relationship between false memory creation and various individual differences in personality traits and mental health variables has been addressed, e.g. fantasy proneness (e.g. Geraerts, Smeets, Jelicic, van Heerden, & Merckelbach, 2005; Horselenberg, Merckelbach, van Breukelen, & Wessel, 2004), depression (e.g. Horselenberg, Merckelbach, van Breukelen, & Wessel, 2004; Roberts, 2002; Wright, Startup, & Mathews, 2005), anxiety (e.g. Roberts, 2002; Wenzel, Jostad, Brendle, Ferraro, & Lystad, 2004), dissociation (e.g. Geraerts et al., 2005; Hyman & Billings, 1998; Platt, Lacey, Iobst, & Finkelman, 1998; Wright et al., 2005; Wright & Livingston-Raper, 2002), as well as exposure to traumatic events (e.g. Brennen, Dybdahl, & Kapidzic, in press; Geraerts et al., 2005; Zoellner, Foa, Brigidi, & Przeworski, 2000). Overall, these studies have revealed inconsistent results. Some have found a positive correlation between false memory creation and these variables and others have not found any relationship between them. Hence, to get a clearer picture of the relationship between false memories and various individual differences there is a need for more studies investigating this.

Living in an environment behind locked doors and with their probably rather distinct histories, it is interesting to address memory issues within a prison inmate population. Specifically, it seems probable that these individuals differ from the “normal” population independently of their imprisonment. Their criminal acts indicate a rather difficult past and possibly childhood. Naturally, past experiences contribute strongly to who a person is. Also, high security prisons are characterized by isolation from the outside world. The everyday routine for these individuals also largely consists of the same activities from day to day, thus making the days very similar and difficult to separate from each other. This means that there is a lack of variety of cues with which to trigger autobiographical or prospective memories. Prison is likely characterized as an environment where memory is rarely encouraged, fostered or tested. This suggests that inmates' memory should be relatively impaired. Furthermore,

inmates are a particularly interesting group to study since this group has been found to be higher on individual differences such as depression (e.g. Butler, Allnutt, Cain, Owens, & Muller, 2005; Domalanta, Risser, Roberts, & Risser, 2003), PTSD (e.g. Butler et al., 2005), and dissociation (e.g. Baker and Beech, 2004; Timmerman and Emmelkamp, 2001).

An exploration of inmates' vulnerability to false memory creation may have implications for police investigations and possible false confessions of criminal acts. In a number of studies, Gudjonsson and colleagues (for a review see Kassin & Gudjonsson, 2004) have investigated the prevalence and the nature of false confessions in both criminal and non-criminal populations. For instance, the authors acknowledge the powerful effect of suggestive techniques, often used in police interrogations, on the suspect's memory of the crime. In such circumstances people may become confused about the source of a memory, create false memories of the event, and eventually falsely confess to a crime. The relevance of this here is that inmates as a group might be expected to be high on suggestibility, though it is not implied that any of the participants have direct experience with false confessions or have been subjected to suggestive techniques by the police. During imprisonment, cases of some inmates may also be reopened. This means that their memories of the crime once again are challenged. Several rounds of interrogation, as well as a variety of stories and perspectives presented by witnesses and the prosecutor may have a suggestive effect and cause the person to recreate his/her memories of the crime. Source monitoring errors can occur, in that the defendant attributes details and parts of others' story to his/her own memories. As far as we know, no studies have to this date explored false memory creation in inmates.

The DRM paradigm

One common task developed to elicit false memories is the Deese-Roediger-McDermott (DRM) paradigm (Deese, 1959; Roediger & McDermott, 1995). This is a word memory task, which has been applied in a number of studies of false memory creation. In this task, lists of associated words, all strong associates of a nonpresented critical lure, are presented to the participants. On a subsequent recognition test the participants are presented with some of the words that were present on the initial word presentation, the critical lures, words less related, as well as words unrelated to the words on the original lists. They are asked to give a yes/no response to each word, indicating whether the word was present on the original word presentation. This paradigm has been shown to produce robust false memory effects of the critical lures (e.g. Geraerts et al., 2005; Roediger & McDermott, 1995; Wright, Startup &

Mathews, 2005). Roediger, Watson, McDermott, and Gallo (2001) suggest that mainly two factors, together accounting for 68% of the variance in false recall, predict false memory responses in the DRM paradigm. The two factors are the associative connection between the critical lure and the studied words, and the general ability to recall the lists. As the authors point out, “these results fit well within the theoretical framework postulating that both semantic activation of the critical item and strategic monitoring processes influence the probability of false recall and false recognition in this paradigm” (Roediger, Watson, McDermott, & Gallo, 2001, p. 385).

Brédart (2000) conducted a study with the purpose of explaining why some participants do not produce false memories of the critical lure. Two possible explanations were proposed and tested; the absence of false memory creation is due to a failure of the lists to generate the critical lure, or to the fact that participants think of the critical lure when hearing the list and are able in the recall phase to remember that the name did not derive from an external source (e.g. the list). A version of the DRM task was applied, with lists containing names of famous persons and cartoon characters. An important supplement to the classic DRM paradigm in the study of Brédart was a third phase, in which the participants were asked to say whether a word had come to their mind during the two first phases of the study (recall and confidence rating), but that they did not recall it because they thought it had not been presented by the experimenter. Of the participants who did not falsely recall the critical lure in the first recall phase, most said that they had thought about it and remembered that it did not derive from the lists, indicating that the second explanation proposed made most sense. A failure to elicit false recall of the critical lure in the DRM paradigm was more strongly associated with successful source monitoring rather than a failure of the list to generate the critical lure.

Research investigating individual differences and false memory creation

Roberts (2002) states that there seem to be two groups of individual differences influencing false memory creation; personality factors and mental state variables. In a study where participants were exposed to pictures and words followed by a recognition test of pictures, he investigated false memory and the effects of individual differences in depression, trait anxiety, imagery vividness, and the interaction of these variables with stress. The results revealed that participants scoring low on trait anxiety were more likely to respond “remember” (as opposed to “know”) to false memories compared to participants scoring high on trait anxiety. In addition, those scoring high on imagery vividness created more false

memories than their counterparts, and the false memory rate for these participants was twice as high when they were stressed. They found no relationship between depression and the tendency to produce false memories.

A line of research supports the finding that there is no relationship between false memories and anxiety. Wenzel and colleagues (2004), for instance, investigated this relationship in nonfearful/nonanxious, spider fearful, blood fearful, and socially anxious participants. These researchers applied a version of the DRM paradigm which included both neutral and threat words. The threat words presented to a participant were relevant for the type of anxiety he/she was suffering. The hypothesis that anxious and fearful individuals are more susceptible to producing false memories of threat words was not confirmed. For neutral words, however, participants with fear for blood or spiders produced more false memories than the other participants. Wenzel et al. remark that a possible explanation for this may be that fearful individuals are distracted by the threat words, and as a consequence perform worse on the neutral words than the others.

The susceptibility to false memory creation has also been studied with trauma-exposed individuals with and without PTSD. Zoellner et al. (2000) hypothesized that traumatized individuals would create more false memories than a non-traumatized control group in the DRM task. In line with this hypothesis, they found that both PTSD patients and traumatized (not diagnosed with PTSD) individuals produced higher false memory rates of the critical lure than the control group. Similarly, Brennen, Dybdahl, and Kapidzic (in press) compared rates of false memories in a group of individuals diagnosed with PTSD with a group of trauma-exposed controls not diagnosed with PTSD. All of the participants were traumatized during the war in Bosnia in the 1990's. The DRM task applied in this study included both war-related and neutral words. Their findings revealed that PTSD patients and traumatized individuals produced equal numbers of false memories of neutral critical lures, but there was a tendency for PTSD patients to produce more false memories of trauma-related critical lures than the traumatized participants. Interestingly, they also found that depression was more strongly related to false memory creation than trauma. Similarly, Geraerts et al. (2005) found no relationship between false memory creation in the DRM task and self-reported trauma in women reporting recovered or repressed memories of child sexual abuse (CSA).

In the previously discussed study by Roberts (2002) the participants' scores on Beck Depression Inventory (BDI) did not correlate with false memory creation. A similar finding was obtained by Horselenberg et al. (2004) in their study of false autobiographical memories. Investigating the relationship between false autobiographical memories and self-reported scores on depression, fantasy proneness, absorption, dissociation, and suggestibility, these researchers found no correlation, with one exception. Participants scoring high on fantasy proneness actually tended to perform better on the recognition task. This result is not in line with what for instance Geraerts et al. (2005) found, that fantasy proneness correlates positively with false memory responses.

Wright et al. (2005) found an association between negative mood and false memory creation when participants were instructed to remember as many words as they could, but not when instructed to remember as many words as they wanted to. They explain these effects by referring to the mood-as-input hypothesis (or affect-as-information hypothesis), which predicts an interaction between mood and task demands.

Applying a variety of paradigms, several studies have found correlations between self-reported dissociation and false memories (e.g. Hyman & Billings, 1998; Wright & Livingston-Raper, 2002) while others have failed to demonstrate a significant relationship between the two variables (e.g., Geraerts et al., 2005; Platt et al., 1998; Wright et al., 2005). In a study with a sample of women reporting recovered, repressed, continuous, or no memories of child sexual abuse (CSA) a group of researchers found that individuals reporting recovered memories of CSA are more prone than the three other groups to falsely recognize and recall both neutral and trauma-related lures in the DRM paradigm. However, as it turned out, fantasy proneness was the factor predicting false memories. Dissociation and self-reported traumatic experiences were not (Geraerts et al., 2005). In line with this, Platt et al. (1998) found no correlations between dissociation and memory distortion in both autobiographical and laboratory-generated memories. Applying the DRM task, Wright et al. (2005) arrived at similar results. They found no relationship between false memories and dissociation.

In contrast, other studies have found a relationship between memory distortion and dissociation. For instance, Wright and Livingston-Raper (2002) conducted a study where participants viewed a video showing a crime being committed. Subsequently, they completed

questionnaires, which included some misleading questions about what they had seen on the video. A filler task followed before the participants completed another questionnaire, this one actually testing their memories of the crime, and more importantly the effect of the misleading questions in the previous questionnaires on their memories. The results indicated that memory distortion and dissociative symptoms were positively correlated. Similarly, Hyman and Billings (1998) used a procedure where participants were asked about several true and one false event from their childhood, all of which the participants thought were based on information provided by their parents. Among other questionnaires, the DES was administered to the participants, and these scores were found to positively correlate with memory creation of the false event. Apparently, only one study in which the DRM paradigm has been applied has found a significant positive correlation between false memories and dissociation (Winograd, Peluso, and Glover, 1998).

Thus, on one hand, in studies where the participants have been exposed to suggestions about an event and possibly created false memories of it, a positive correlation between false memory creation and self-reported dissociation has been found (e.g. Hyman & Billings, 1998; Wright & Livingston-Raper, 2002). On the other hand, the vast majority of studies in which the DRM paradigm have been applied show no significant correlation between false memories of the critical lure and dissociation (e.g., Geraerts et al., 2005; Platt et al., 1998; Wright et al., 2005).

Wright et al. (2005) offer an explanation of the differing results between the studies investigating the relationship between false memory creation and dissociation. They argue that the studies that have found an association between the two have used other procedures than the DRM procedure. According to these researchers the DRM task requires two processes for a false memory to be created; the generation of the critical lure, and mistaking its source. The majority of procedures require only a source monitoring error. Based on this reasoning, Wright et al. suggest that dissociation is related to source monitoring errors.

The mental health of inmates

A number of studies, some of which were reviewed above, have investigated the relationship between mental health variables and false memory creation. By looking into the research investigating the same mental health variables in inmates, it is possible to get an idea of inmates' susceptibility to producing such false memories.

Moreover, studies investigating the prevalence of mental disorders among inmates have revealed that this group seems more vulnerable to psychological disorders and maladaptive personality characteristics. A variety of studies have attempted to identify the presence of different disorders and personality traits within criminal populations. Among the variables investigated are mood disorders, dissociation, personality disorders, trauma, alcohol/drug abuse/dependence, and attachment styles. Some studies have compared different types of offenders, e.g., sexual and violent offenders (e.g. Baker & Beech, 2004), some have investigated differences between female and male offenders (e.g. Butler et al., 2005; Domalanta et al., 2003), and some have compared offenders with different ethnic backgrounds (e.g. Butler et al., 2005; Domalanta et al., 2003) with respect to the prevalence of mental disorders and personality traits.

Butler et al. (2005) investigated the prevalence of mental disorders among new receptions to the correctional system, and among sentenced offenders in New South Wales, Australia. The sample included both women and men. They found that 43% of all the offenders had at least one of the following diagnoses: Psychosis, anxiety disorders, or mood disorders. The prevalence rate among the reception offenders was higher than among the sentenced offenders (46% vs. 38%). Of all the offenders, 36% had suffered from an anxiety disorder, and 20% had suffered from at least one type of mood disorder. The most common diagnosis in this sample was posttraumatic stress disorder (26% for receptions, 21% for sentenced offenders). The results also revealed that female offenders were more likely than men to suffer from depression, manic episodes, and anxiety disorders.

Similarly, Domalanta and colleagues (2003) studied mental disorders among 1024 male and female youth offenders in Harris County Juvenile Detention Center (HCJDC), and found that 60% suffered from one or more mental disorders. The participants completed the Beck Depression Inventory (BDI) and the Patient Health Questionnaire (PHQ). The two questionnaires revealed rather differing results concerning the prevalence of depression. According to BDI, 25% of the offenders qualified for moderate depression and 22% for severe depression. According to the PHQ, however, 9,77% suffered from major depression. The results from the PHQ questionnaire also showed that 41% of the youth offenders suffered from drug abuse and 27% from alcohol abuse. 29% qualified for one of the other disorders. Co-morbidity of disorders was common. In contrast to Butler et al. (2005), these researchers found no difference between men and women concerning the prevalence of moderate or

severe depression. They did, however, find that women had more anxiety problems than men. In addition, comparing African-American, Hispanic, and white offenders, they found that there was less drug and alcohol abuse among African-American offenders, and a higher prevalence of anxiety disorders among white offenders. Only 20% of the mentally disturbed offenders had been diagnosed and treated for their disorder.

In a study by Longato-Stadler, Knorrning, and Hallman (2002) the prevalence of mental and personality disorders were investigated within two high security prisons in Sweden. One hundred and thirty male inmates with a history of heavy criminality were interviewed and completed questionnaires concerning mental health and personality. Overall, 57% of the inmates had a mental disorder, 56% had a personality disorder, and 31% had both a mental and a personality disorder. 51% suffered from drug abuse/dependence, which was the most common mental disorder in this study. 9% qualified for major depression (which is approximately the same as for the general population), and a small percentage (0,8%) (lower than for the general population) suffered from anxiety disorders. The prevalence and co-morbidity of personality disorders were high in this study. 56% of the inmates had a personality disorder, with 39% of them qualifying for antisocial, 29% for paranoid, and 27% for borderline personality disorder. The results from the personality questionnaires revealed that these inmates scored high on impulsiveness, sensation-seeking, hostility, aggression, psychopathy-related scales, and anxiety-related scales (although a very low percentage actually suffered from anxiety disorders).

Like Butler et al. (2005), Timmerman and Emmelkamp (2001) found a high prevalence of traumatic experiences in forensic patients (78%) and inmates (75%). Interestingly, they also found that dissociation was more common among inmates than forensic patients. The authors suggest that this may be due to the environment in which the inmates live. Forensic patients are probably given more attention and support than inmates who live more anonymously in large groups. Finally, this study revealed that forensic patients and inmates diagnosed with borderline personality disorder, as opposed to those not diagnosed with this reported significantly more dissociative symptoms. Likewise, Baker and Beech (2004) found that sex offenders and violent offenders show higher levels of dissociation than a non-offending control group. Additionally, these two groups of offenders showed more variability over time in early adaptive schemas.

The present study

The main aim of the present study is to investigate susceptibility to false memory creation among inmates in a Norwegian prison and preventive institution. The majority of the inmates in this prison (67 out of 110) have been sentenced to preventive detention (in Norwegian this is called “forvaring”), and many of them have been diagnosed with various psychological disorders. The preventive detention sentences mean that they are considered a threat to society and that there is a considerable risk of recidivism. For that reason they will be evaluated throughout their imprisonment and go through psychological assessments before being released. Their sentence may be prolonged if they are still considered a threat to society. Additionally, the relationships between false memories and self-reported depression, anxiety, dissociation, and fantasy proneness are investigated. The prevalence of depression, anxiety, dissociation, and fantasy proneness in inmates will also be explored. The group of inmates is compared with a control group on false memory creation and on the various self-report measures.

Since this is a group of individuals with a high occurrence of clinical diagnoses, it is expected that inmates will score higher than the control group on depression, anxiety, and dissociation. Although the evidence does not consistently point in one direction, studies investigating the mental health of inmates generally reveal that there is a higher occurrence of mental disorders among these individuals compared to “normals” (e.g. Baker & Beech, 2004; Butler et al., 2004; Longato-Stadler, Knorrning, and Hallman, 2002). It appears that a very restricted amount of research has explored fantasy proneness in prison inmates. However, one study by Maaïke, Merckelbach, Klein, Shellbach, & Kremer (2001) revealed no significant difference of mean fantasy proneness scores between the inmates participating in the study and “normals” reported in previous studies. The present study will investigate this relationship further.

Possibly due to the difficulty of access to inmates as research participants, there is a lack of research investigating inmates' cognitive performance, and none on their susceptibility to false memory creation. One may, however, expect that inmates are more prone to producing false memories than “normals” if depression, anxiety, and dissociation are positively related to false memory creation. Since studies investigating this reveal differing results, it is problematic to rely on them. On the other hand, it seems reasonable to expect that a degree of isolation and lack of stimuli from the outside world in addition to an everyday characterized by routine, lead to a lack of cues to which memories are associated, hence possibly disturbing

normal memory functioning. In addition, these are individuals with probably rather idiosyncratic histories. For instance, some studies have shown that there is a higher occurrence of trauma exposure among inmates compared to controls (e.g. Butler et al., 2004; Timmerman & Emmelkamp, 2001). Particularly relevant here is it that trauma also has been linked to false memory creation (e.g. Zoellner, 2000). In the present study it is therefore hypothesized that the group of inmates are more prone to false memory creation, which in the present study means false recognition of the critical lures, than the control group.

Overall, depression, dissociation, and fantasy proneness have been found to positively relate to false memory creation, but anxiety has not. In line with this, we expect depression, dissociation, and fantasy proneness, but not anxiety, to positively correlate with false recognition of the critical lure.

Method

Participants

Twenty-four Norwegian male prison inmates with a mean age of 35.4 (SD=11.1) participated in the study. Sixteen of them had been sentenced to preventive detention and eight were regular inmates. The mean length of sentences among detention inmates was 7.1 years and among regular inmates 9 years, giving an overall mean of 7.7 years. The vast majority had been convicted for murder, rape, or violence. 50% of the inmates had a previous history of drug use. The control group consisted of 24 participants as well, with a mean age of 37.2 (SD=11.7). They were recruited after all the inmates had been tested. Ten of them were prison guards from another prison, six of them were students, and the eight remaining participants worked in various professions. They were either from the Oslo area or from the Hamar area. All of the control participants were recruited with the purpose of matching this group with the group of inmates on age and, as far as possible, on education. 12.5% of the control participants had a previous history of drug use. A t-test revealed that there was no significant age difference between the two groups, $t(46)=-.56$, *ns*. Education level, however, was significantly higher in the control group than in the group of inmates. The mean number of years of education were 11.7 (SD=2.3) in the group of inmates and 14.7 (SD=1.7) in the control group, $t(46)=5.20$, $p<.001$.

Deese-Roediger-McDermott (DRM) paradigm

The DRM task applied in this study was a Norwegian version that consisted of 12 neutral word lists, each containing 10 strong associates of a critical lure (appendix III). They were taken from Håseth (1968) translation and norms based on Russel and Jenkins' (1954) word lists (Tollefsen, 2002). For instance, one of the lists contained the Norwegian words for *sleepy, dream, bed, rest, duvet, tired, bedtime, snore, nightmare, and awake*. The non-presented critical lure of this list is the word *sleep*. The task was administered on a PC but can also be read out loud for the participants. It consisted of three phases; a study phase, a distractor phase, and a recognition phase. In addition to seen words and critical lures, unseen weakly related and unrelated words to the presented lists were present in the recognition test.

Instruments

In the present study, Norwegian versions of Beck Depression Inventory (BDI-II), Beck Anxiety Inventory (BAI), and Dissociative Experiences Scale (DES), and a Norwegian translation of the Creative Experiences Questionnaire (CEQ) were administered to the participants.

Beck Depression Inventory-II (BDI-II)

The BDI-II (Beck, Steer & Brown, 1996) was developed in accordance with the diagnostic criteria for Major Depressive Disorder (MDD) as described in the American Psychiatric Association's DSM-IV. It is a self-administered inventory that measures the current level of depression in adults and adolescents. It contains 21 items, each proposing four alternative statements concerning how one has felt "the last two weeks, including today" on a scale from 0-3. The 21 items include sadness, pessimism, feelings of failure, loss of pleasure, guilty feelings, punishment feelings, self-dislike, self-criticalness, suicidal thoughts or wishes, crying, agitation, loss of interest, indecisiveness, worthlessness, loss of energy, changes in sleeping pattern, irritability, changes in appetite, concentration difficulties, tiredness and fatigue, and loss of interest in sex. The total depression score range from 0-63. A total score of 0-13 indicate minimal depression, 14-19 indicate mild depression, 20-28 indicate medium depression, and a total score of 29-63 indicate severe depression. Administering the BDI-II to 26 polyclinic patients at two separate times, Beck, Steer, and Brown measured the test-retest correlation to be .93.

Beck Anxiety Inventory (BAI)

Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown & Steer, 1988) is a 21-item self-report inventory measuring severity of anxiety. Every item represents an anxiety symptom. The respondents rate the severity of each symptom on a 4-point scale (0-3) ranging from *not at all* (0) to *severely – I could barely stand it* (3), indicating in what degree they have experienced this symptom “the last week, including today”. The total anxiety score range from 0-63. A total score of 0-7 indicate minimal level of anxiety, 8-15 indicate mild level of anxiety, 16-25 indicate medium level of anxiety, and a total score of 26-63 indicate severe level of anxiety. The 21 items include numbness or tingling, feeling hot, wobbliness in legs, unable to relax, fear of the worst happening, dizzy or light-headed, heart pounding or racing, unsteady, terrified, nervous, feelings of choking, hands trembling, shaky, fear of losing control, difficulty breathing, fear of dying, scared, indigestion or discomfort in abdomen, faint, face flushed, and sweating (not due to heat). Beck et al. (1988) report high internal consistency ($\alpha=.92$) and test-retest reliability ($r=.75$). BAI was also shown to discriminate anxious diagnostic groups from nonanxious diagnostic groups.

Dissociative Experiences Scale (DES)

The DES is a 28-item self-administered scale designed to measure the frequency of dissociative tendencies like depersonalisation, derealisation, and disturbances in memory. The respondents are asked to indicate what percentage of the time they have experiences, such as finding oneself at a place without knowing how one got there and feeling that one's body does not seem to belong to oneself. Each item has a numerical scale from 0 to 100 (percentage) in 10 point intervals. Higher scores indicate higher dissociative tendencies (Bernstein & Putnam, 1986). In Carlson and Putnam's (1993) review of studies with the DES they report test-retest reliabilities ranging from .78 to .96.

Creative Experiences Questionnaire (CEQ)

The CEQ was developed by Merckelbach, Muris, and Rassin (1999). It is based on Wilson and Barber's (1983) listing of 40 fantasy proneness characteristics, and includes 25 dichotomous (yes/no) items measuring the degree of experiences related to daydreaming, imagining, and intense fantasizing. These are statements, such as “as a child, I strongly believed in the existence of dwarfs, elves, and other fairy tale figures” and “I often confuse fantasies with real memories”. The CEQ has shown adequate test-retest stability ($r=.95$) and internal consistency ($\alpha=.72$) (Merckelbach, Horselenberg & Muris, 2001). Before the CEQ

was developed, the Inventory of Childhood Memories and Imaginings (ICMI) was the instrument most frequently used to measure fantasy proneness. Merckelbach, Wiers, Horselenberg, and Wessel (2001) investigated the degree to which the CEQ and the ICMI measure the same construct. Their results revealed a correlation between the two scales ($r=.77$). Similarly, in a number of studies Merckelbach and colleagues (e.g. 1999) found correlations ranging from .47 to .63 when investigating the relationship between the CEQ and Dissociative Experiences Scale (DES). In another study, Horselenberg, Merckelbach, Muris, Sijsenaar, and Spaan (2000) found that there was no correlation between fantasy proneness and the tendency to endorse socially desirable responses.

The CEQ was translated into Norwegian, to fit the participants in the present study. To ensure as good a translation as possible the Norwegian version was translated back to English by an individual translator.

Research ethics and recruitment

Contact was initially established with the school section of a Norwegian prison in the Oslo area. Several meetings with this section and one of the psychologists in the prison followed, and the reasons for the project, as well as the procedure, potential logistical and ethical challenges, requirements and constraints linked to the study were discussed. After the study had been approved by the southern Norwegian Committee for Medical Research Ethics, the Norwegian Social Science Data Services, and Kriminalomsorgen region nordøst, the recruitment of participants was initiated. The study was presented at a meeting held for ten inmate representatives, one from each of the prison wards. In line with suggestions from inmate representatives, posters advertising the project were put up in the different wards in the prison (appendix IV). Several weeks later the project leader and the student visited the prison to give more information about the project to any interested inmates on each ward. At this point appointments were made with the ones interested in participating. The whole process of recruiting the inmates took six months.

Several ethical considerations had to be taken into account in this study. Generally speaking, inmates are a vulnerable group being under such restrictions and surveillance. It was important to make sure that the participants felt that taking part was truly voluntary and that choosing not to take part would not have any negative consequences for them. For this reason the prison staff were not directly involved in the recruitment of participants. Also, information

about the project was provided to the participants, by posters and oral information from their inmate representatives, several weeks before they decided if they wanted to participate. Inmates sentenced to preventive detention are used to the fact that testing and assessment have consequences for their sentence and when they will be released. Thus it was made clear to the participants that this project and the tests administered are for scientific reasons only. The participants were not offered any financial incentives. Since this is a group of individuals with a very low level of income, financial incentives might have been too tempting for the inmates. Instead, they have been offered a presentation of the results and a lecture on how to improve one's memory by the project leader.

Procedure

The participants were tested individually over one session lasting for approximately one hour. They were first informed about their rights and asked to sign an informed consent form (appendix I). Following this, the participants were asked to complete a form developed for the purpose of the present study, which consisted of four questions asking for the participant's age, level of education, current and/or previous use of drugs, and current use of medications (appendix II). Next, the participants completed the DRM task. They were informed about the procedure in the three phases of the task before completing it. In the first phase the 120 words were presented to the participants. Prior to the presentation the participants were told that they would be presented with several lists of words. They were asked to concentrate and pay attention to the words appearing on the screen because their memory of the words would be tested subsequently. The second phase was a distraction phase consisting of three nonverbal reasoning tasks. The participants were asked to choose one of eight alternative figures fitting into a logical pattern of figures. The last phase was the recognition of words. The participants were told that they would be presented with one word at a time, some of which had been presented in the first phase and some of which had not. For each word they were asked to indicate if the word had been present in the first phase or not by pressing "N" for "no" and "Y" for "yes". Subsequently, the self-report measures were administered to the participants. In order, they were asked to complete the BDI-II, BAI, DES, and finally the CEQ. All questionnaires were explained to the participants before completion. The participants were debriefed after the testing. At this point they had the opportunity to ask questions about the test procedure and the study in general.

Results

The mean participant scores were calculated for both groups with regards to depression, anxiety, dissociation, fantasy proneness, and false memory creation. Independent samples t-tests were computed in order to discover possible differences between the groups. The mean scores and the t-tests of depression, anxiety, dissociation, and fantasy proneness are shown in Table 1.

Table 1: Mean Scores on Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Dissociative Experiences Scale (DES, in %), and Creative Experiences Questionnaire (CEQ) with Associated t-values (with Standard Deviations in Brackets).

	Inmates (n=24)	Control group (n=24)	t	(df=46)
BDI	12.71 (7.93)	5.83 (7.52)	3.08**	
BAI	5.88 (7.47)	3.25 (4.21)	1.50	
DES	10.60 (5.44)	6.38 (6.73)	2.39*	
CEQ	7.63 (3.13)	4.63 (3.40)	3.18**	

*p<.05. **p<.005

Significant differences between the groups were found with regards to depression, dissociation, and fantasy proneness, with inmates scoring higher than the control group.

False memories

The mean false recognition (FR) scores of the critical lures and mean recognition scores of seen words, as well as mean false alarms of unseen weakly related words and unseen unrelated words were calculated for both groups. The two groups were compared on these scores by two-tailed independent samples t-tests. The results are shown in Table 2.

Table 2: Mean number of “Yes” responses per condition by group, with Associated t -values for Critical Lures (FR), Seen Words, Unseen Weakly Related Words, and Unseen Unrelated Words (with Standard Deviations in Brackets).

	Inmates ($n=24$)	Control group ($n=24$)	t	($df=46$)
Seen words	18.00 (6.01)	22.45 (5.33)	2.65*	
Critical lures (FR)	5.71 (3.11)	7.29 (2.07)	2.07*	
Unseen weakly related	1.92 (1.74)	1.58 (1.67)	2.68	
Unseen unrelated	2.13 (2.55)	1.38 (1.66)	1.21	

* $p < .05$.

As this table shows, the control group actually falsely recognized more critical lures than the group of inmates. The control group also recognized significantly more words that had been present in the first phase of the memory task than the group of inmates.

Correlations

As can be seen in Table 3, no significant correlation was found between false memory creation and the different individual differences measures (depression, anxiety, dissociation, and fantasy proneness). There were, however, positive, significant correlations between all the individual differences measures, with the exception of BAI and CEQ.

Table 3: Pearson correlation coefficients between scores on Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Dissociative Experiences Scale (DES), Creative Experiences Questionnaire (CEQ), and FR (False Recognition).

	BAI	DES	CEQ	FR
BDI	.72***	.71***	.41*	-.23
BAI		.47***	.23	-.28
DES			.41***	-.13
CEQ				-.11

*. Correlation is significant at .05 level (2-tailed).

***. Correlation is significant at .001 level (2-tailed).

Discussion

The present study was the first to investigate false memory creation in prison inmates. It was hypothesized that the group of inmates would be more prone to producing false memories of the critical lures than the control group. As it turned out, this hypothesis was not confirmed. On the contrary, the control group falsely recognized significantly more of the critical lures compared to the inmates.

A plausible explanation for this could be that the inmates were more motivated for the memory task than the control group. They had heard more about the study before deciding if they wanted to participate, and had a longer time to prepare for the testing. In their environment characterized by routine, it might also have been a more positive experience for the inmates. The fact that these individuals are evaluated continuously, and are used to going through tests and assessment may also have influenced their performance on the memory task. For instance, they might have been more focused on giving the right answers and avoid falling into traps, thus performing better in recognizing critical lures. However, motivation is unlikely the explanation of the superior performance of inmates compared to the control group, since the inmates performed worse than the control group on the recognition of the seen words.

Another possible explanation could be that inmates have a stronger tendency to give No responses. They gave significantly more No responses than the control group to critical lures and seen words. On the other hand, if this were the explanation the inmates would be expected to give more No responses to unseen weakly related and unseen unrelated words as well. This was not the case. The inmates gave more Yes responses to these words, though the difference between the groups was not significant.

In line with Brédart's (2000) findings the inmates participating in this study may for some reason have recognized more of the critical lures during the initial presentation of the word lists, and remembered them better in the recognition task compared to the control group. If so, this may be related to inmates' source monitoring skills. Since the inmates only performed better than the controls on the recognition of the critical lures and not on the three other groups of words, it is likely that their performance is related to source monitoring processes, namely that they are better at identifying the source of the critical lure.

These unexpected results regarding inmates' better performance compared to controls when recognizing critical lures are very interesting but difficult to explain. Further investigation of inmates' memory performances is needed. This is discussed more in depth below.

False memory creation and depression, anxiety, dissociation, and fantasy proneness

No significant correlation between false memory creation and the various individual differences was found in this study. This is in line with a number of studies (e.g. Geraerts et al., 2005; Horselenberg et al., 2004; Platt et al., 2005; Roberts, 2002; Wenzel et al., 2004; Wright et al., 1998). The fact that no positive correlation was found between false recognition of the critical lure and the individual differences corresponds to the other results, namely that inmates falsely recognized fewer of the critical lures but scored higher than the control group on depression, dissociation, and fantasy proneness.

Similar to most other studies in which the issue has been investigated, the present study did not reveal a significant correlation between dissociation and false memories. Geraerts et al. (2005), for instance, found a nonsignificant positive relationship between the two, as did Wright et al. (2005). A possible explanation for this is the one suggested by Wright et al. (2005). That is, that the DRM task requires two processes (generation of the critical lure and a source monitoring error) for a false memory to be created, while dissociation is only related to source monitoring errors. Horselenberg et al. (2004) predicted an influence of dissociation and other individual differences on source monitoring performance among their participants. Discussing their results, which revealed no correlation between false recognition and the various variables (with the exception of fantasy proneness), they suggested that source monitoring decisions is highly involved in recall tests but not in recognition tests.

All the individual differences, with the exception of anxiety (BAI) and fantasy proneness (CEQ), were found to correlate. Like in the study by Horselenberg et al. (2004) the present study revealed significant correlations between dissociation (DES) and fantasy proneness, and between depression (BDI-II) and fantasy proneness. The positive correlation between BDI-II and BAI ($r=.72$) found in this study turned out to be even higher than what Beck, Steer, and Brown (1996) found ($r=.60$). This indicates that there was high co-morbidity of depressive symptoms, anxiety symptoms, dissociative tendencies, and fantasy proneness traits.

Depression, anxiety, dissociation, and fantasy proneness in the group of inmates and the control group

In line with the expectations and a number of previous studies (e.g. Baker & Beech, 2004; Butler et al., 2005; Timmerman & Emmelkamp, 2001) investigating mental health of inmates, higher scores were found on depression, anxiety, and dissociation in the group of inmates compared to the control group. However, with regards to anxiety the difference between the groups did not reach statistical significance. In contrast to the study by Maaïke and colleagues (2001), the present study revealed that the inmates scored significantly higher than the control group on the CEQ, measuring fantasy proneness. This corresponds to the present results since the inmates scored significantly higher than the control group on depression and dissociation as well, and fantasy proneness was shown to correlate positively with both dissociation and depression.

Although inmates scored significantly higher than the control group, both groups' mean scores on dissociation were lower than the one reported by van Ijzendoorn and Schuengel (1996) in the general population ($M = 11.6$; $SD = 10.6$). Similarly, both of the groups scored well below a random sample from the normal population and university students in England on anxiety (Dent & Salkovski, 1986; e.g. $M=8.9$; $SD=7.3$). Additionally, the present results revealed lower CEQ scores for both groups compared to scores in a group of undergraduate students reported by Merckelbach, Horselenberg, and Muris (2001) ($M=7.7$; $SD=4.7$). With regards to depression, however, the inmates scored well above a Norwegian sample in a study by Aasen (2001) ($M=7.3$; $SD=7.1$) (Beck, Steer, and Brown, 1996). The low scores with regards to dissociation, anxiety, and fantasy proneness in the present study compared to results revealed in other studies may be related to different languages of the questionnaires or participants living under different cultural conditions. Translation of a questionnaire to a new language might not capture all the important elements of the original questionnaire. Culture-related factors, such as a culture's view of psychological disorders, may also be a cause. In certain cultures a prejudiced view of mentally ill individuals still exists, though it may not be publicly expressed. Similarly, societies and families may possess such views, even in cultures where the majority of the people do not. Social desirability is an important factor in relation to this. Some individuals may respond in line with what they see as socially desirable, hence underreporting symptoms of depression, anxiety, dissociation, and fantasy proneness.

Limitations of the present study

To strengthen the generalizability of the results to other inmates, additional inmates recruited from other Norwegian prisons should have taken part in this study. The reason for this is, firstly, that the majority of the inmate participants in the present study have been sentenced to preventive detention. They may be somewhat different from regular inmates. Secondly, this prison differs from most other Norwegian prisons in that it has especially strong focus on rehabilitation and change of attitudes and behaviour. The inmates are offered for instance group therapy and stress management programs, and are evaluated on a daily basis with respect to for example social and cognitive skills, behaviour, and participation in treatment programs. Establishing contact, getting access, planning, recruiting, and organizing a research project within a prison is both challenging and time consuming. Recruitment of additional participants would require access to more prisons, and hence more available time and resources.

Current lengths of served imprisonments were not taken into account. Possibly, this could also be of relevance for the present results. For instance, if a sufficient number of participants had served only a short time of their sentence at the time of testing, it could not be expected that their memory performances would be so much influenced by environmental conditions.

Many of the inmates who participated in this study are diagnosed with various psychological disorders. In the preparatory meetings with the inmate representatives it became clear that information about their diagnoses would be too sensitive, and uncomfortable to share.

Therefore, they were not asked to report this. Hence, the possibility that inmates' diagnoses have influenced the results can not be investigated. Two additional variables can not be ruled out either as having an influence on the memory performance and the responses on the BDI-II, BAI, DES, and CEQ. That is, participants' education level and previous experiences (e.g. traumatic events). Both education and for instance previous trauma exposure is assumed to have an influence on both memory and mental health.

Overall, a more suitable control group, matched with the inmates on education in addition to age, as well as more control over other possibly intruding variables, like measuring previous trauma exposure, would strengthen this study.

Implications for future research

Apparently, more research is needed to get a clearer picture of the relationship between false memory creation and various individual differences. The results differ to a large extent, revealing positive, negative, and no relationship between the variables. Depression-related, anxiety-related, and trauma-related words, depending on which of the variables that are investigated in relation to false recognition, should be used in the DRM paradigm to expand the findings of these relationships.

To test the assumptions of Wright et al. (2005) of the relationship between false memories and dissociation, studies should be designed to distinguish between the generation of the critical lure and source monitoring processes. This can be obtained by using a similar version of the DRM task to the one applied by Brédart (2000). Furthermore, this method can also be applied to study inmates' source monitoring abilities, which would be a step towards an understanding of memory processes in prison inmates, and towards exploring the basis of the effect reported here, namely that inmates falsely recognised fewer critical lures than the control group.

False memory paradigms testing suggestibility should also be applied in future studies on the topic. Suggestibility is particularly relevant in relation to police interrogations, testimonies, and confessions. Horselenberg, Merckelbach, Smeets, Franssens, Peters, and Zeles (2006) explored the relationship between false confessions in the laboratory and individual differences in compliance, suggestibility, fantasy proneness, dissociation, and cognitive failures. Their results revealed that of all the individual differences, only fantasy proneness was associated with false confessions. Thus, it seems particularly fruitful to investigate fantasy proneness in criminal populations further. Regardless of the nonexistent relationship between false confessions and suggestibility found by Horselenberg and colleagues, suggestibility in inmates should be explored.

Since some studies (e.g. Butler et al., 2004; Timmerman & Emmelkamp, 2001) have found a higher occurrence of trauma exposure among inmates and trauma has been linked to false memory creation, the prevalence of trauma exposure among inmates and the relationship between false memories and trauma needs further investigation. A further investigation of Brennen et al.'s (in press) results, which revealed that depression was more related to false memory creation than trauma, would also be interesting. The present study found no

association between depression and false memories of the critical lures but this possible relationship, like the relationship between false memory and other individual differences, need to be investigated more closely.

Thus, this study is a start of hopefully further investigations of memory performances among prison inmates. Exploring inmates' proneness to producing false memories also has important practical implications in relation to police interrogations, witness testimonies, and confessions. Generally speaking, this is a rather rarely studied group but it seems that it has been totally neglected within the research of memory. Because of the conditions these individuals are living under, and their possibly rather idiosyncratic histories this is an interesting group to study in this field. The unexpected result in the present study, that inmates produced significantly fewer false memories of the critical lures than the control group, makes it even more interesting to follow up on.

References

- Baker, E. & Beech, A. R. (2004). Dissociation and variability of adult attachment dimensions and early maladaptive schemas in sexual and violent offenders. *Journal of Interpersonal Violence, 19*, 1119-1136.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893-897.
- Beck, A. T., Steer, R. A., & Brown, G. (1996). *BDI-II manual*. Norwegian version. Sandvikens Tryckeri AB.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561-571.
- Belli, R. F., Lindsay, D. S., Gales, M. S., & McCarthy, T. T. (1994). Memory impairment and source misattribution in postevent misinformation experiments with short retention intervals. *Memory And Cognition, 22*, 40-54.
- Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *Journal of Nervous and Mental Disease, 174*, 727-735.
- Brédart, S. (2000). When false memories do not occur: Not thinking of the lure or remembering that it was not heard. *Memory, 8*, 123-128.
- Brennen, T., Dybdahl, R., & Kapidzic, A. (in press). Trauma-related and neutral false memories in war-induced Posttraumatic Stress Disorder. *Consciousness and Cognition*.
- Bruck, M., Ceci, S. J., Francoeur, E., & Barr, R. (1995). "I hardly cried when I got my shot": Influencing children's reports about a visit to their paediatrician. *Child Development, 66*, 193-208.

- Butler, T., Allnutt, S., Cain, D., Owens, D., & Muller, C. (2005). Mental disorder in the New South Wales prisoner population. *Australian and New Zealand Journal of Psychiatry*, 39, 407-413.
- Carlson, B. E., & Putnam, F. W. (1993). An update of the dissociative experiences scale. *Dissociation*, 6, 16-27.
- Deese, J. (1959). On the prediction of occurrence of particular verbal intrusions in immediate recall. *Journal of Experimental Psychology*, 58, 17-22.
- Dent, H. R., & Salkovskis, P. M. (1986). Clinical measures of depression, anxiety, and obsessiveness in nonclinical populations. *Behavioural Research and Therapy*, 24, 689-691.
- Domalanta, D. D., Risser, W. L., Roberts, R. E., & Risser, J. M. H. (2003). Prevalence of depression and other psychiatric disorders among incarcerated youths. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 477-484.
- Drumme, A. B., & Newcombe, N. S. (2002). Developmental changes in source memory. *Developmental Science*, 5, 502-513.
- Geraerts, E., Smeets, E., Jelicic, M., Van-Heerden, J., & Merckelbach, H. (2005). Fantasy proneness, but not self-reported trauma is related to DRM performance of women reporting recovered memories of childhood sexual abuse. *Consciousness and Cognition*, 14, 602-6012.
- Goodman, G. S., Ghetti, S., Quas, J. A., Edelstein, R. S., Alexander, K. W., Redlich, A. D., Cordon, I. M., & Jones, D. P. H. (2003). A prospective study of memory for child sexual abuse: New findings relevant to the repressed-memory controversy. *Psychological Science*, 14, 113-118.
- Horselenberg, R., Merckelbach, H., Muris, P., Sijsenaar, M., & Spaan, V. (2000). Imagining fictitious childhood events: the role of individual differences in imagination inflation. *Clinical Psychology and Psychotherapy*, 7, 128-137.

- Horselenberg, R., Merckelbach, H., Smeets, D., Franssens, D., Peters, G. J. Y., & Zeles, G. (2006). False confessions in the lab: Do plausibility and consequences matter? *Psychology, Crime and Law*, 12, 61-75.
- Horselenberg, R., Merckelbach, H., van Breukelen, G., & Wessel, I. (2004). Individual differences in the accuracy of autobiographical memory. *Clinical Psychology and Psychotherapy*, 11, 168-176.
- Hyman, I. E., & Billings, F. J. (1998). Individual differences and the creation of false childhood memories. *Memory*, 6, 1-20.
- Håseth, K. J. (1968). *Norske ord assosiasjonsnormer*. Oslo: Universitets Forlag.
- Johnson, M. K., Hashtoudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, 114, 3-28.
- Kassin, S. M., & Gudjonsson, G. H. (2004). The psychology of confessions: A review of the literature and issues. *Psychological Science in the Public Interest*, 5, 33-67.
- Longato-Stadler, E., von Knorring, L., & Hallman, J. (2002). Mental and personality disorders as well as personality traits in a Swedish male criminal population. *Nordic Journal of Psychiatry*, 56, 137-144.
- Maaïke, C., Merckelbach, H., Klein, B., Shellbach, M. R., & Kremer, K. (2001). Frontal lobe dysfunctions, dissociation, and trauma self-reports in forensic psychiatric patients. *Journal of Nervous and Mental Disease*, 189, 188-190.
- Merckelbach, H., Horselenberg, R., & Muris, P. (2001). The Creative Experiences Questionnaire (CEQ): A brief self-report measure of fantasy proneness. *Personality and Individual Differences*, 31, 987-996.

- Merckelbach, H., Muris, P., & Rassin, E. (1999). Fantasy proneness and cognitive failures as correlates of dissociative experiences. *Personality and Individual Differences*, 26, 961-967.
- Merckelbach, H., Wiers, R., Horselenberg, R., & Wessel, I. (2001). Effects of retrieving childhood events on metamemory judgments depend on the questions you ask. *British Journal of Clinical Psychology*, 40, 215-220.
- Multhaup, K. S., De Leonardis, D. M., & Johnson, M. K. (1999). Source memory and eyewitness suggestibility in older adults. *The Journal of General Psychology*, 126, 74-85.
- Platt, R. D., Lacey, S. C., Iobst, A. D., & Finkelman, D. (1998). Absorption, dissociation, and fantasy-proneness as predictors of memory distortion in autobiographical and laboratory-generated memories. *Applied Cognitive Psychology*, 12, 77-89.
- Roberts, P. (2002). Vulnerability to False Memory: The Effects of Stress, Imagery, Trait Anxiety, and Depression. *Current Psychology. Developmental, Learning, Personality, Social*, 21, 240-252.
- Robinson, E. J., & Whitcombe, E. L. (2003). Children's suggestibility in relation to their understanding about sources of knowledge. *Child Development*, 74, 48-62.
- Roediger, H. L., & McDermott, K.B. (1995). Creating false memories. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 21, 803-814.
- Roediger, H. L., Watson, J. M., McDermott, K. B., & Gallo, D. A. (2001). Factors that determine false recall: A multiple regression analysis. *Psychonomic Bulletin & Review*, 8, 385-405.
- Rudy, L., & Goodman, G. S. (1991). Effects of participation on children's reports: Implications for children's testimony. *Developmental Psychology*, 27, 527-538.

- Shapiro, L. R., & Purdy, T. L. (2005). Suggestibility and source monitoring errors: Blame the interview style, interviewer consistency, and the child's personality. *Applied Cognitive Psychology, 19*, 489-506.
- Timmerman, I. G. H., & Emmelkamp, P. M. G. (2001). The relationship between traumatic experiences, dissociation, and borderline personality pathology among male forensic patients and prisoners. *Journal of Personality Disorders, 15*, 136-149.
- Tollefsen, I. L. (2002). *Exploring the relationship between false memory and source memory using the DRM paradigm*. (Veileder: Ivar Reinvang). Hovedfagsoppgave. Psykologisk Institutt. Universitetet i Oslo.
- Van Ijzendoorn, M. H., & Schuengel, C. (1996). The measurement of dissociation in normal and clinical populations: Meta-analytic validation of the Dissociative Experiences Scale (DES). *Clinical Psychology Review, 16*, 365-382.
- Wenzel, A., Jostad, C., Brendle, J. R., Ferraro, F. R., & Lystad, C. M. (2004). An investigation of false memories in anxious and fearful individuals. *Behavioural and Cognitive Psychotherapy, 32*, 257-274.
- Williams, L. M. (1994). Recall of childhood trauma: A prospective study of women's memories of child sexual abuse. *Journal of Consulting and Clinical Psychology, 62*, 1167-1176.
- Wilson, S. C., & Barber, T. X. (1983). Fantasy-prone personality: implications for understanding imagery, hypnosis, and parapsychological phenomena. In A. A. Sheikh, *Imagery: current theory, research, and application* (pp. 340-387). New York: Wiley.
- Winograd, E., Peluso, J. P., & Glover, T. A. (1998). Individual differences in susceptibility to memory illusions. *Applied Cognitive Psychology, 12*, S5-S27.
- Wright, D. B., & Livingston-Raper, R. D. (2002). Memory distortion and dissociation: Exploring the relationship in a non-clinical sample. *Journal of Trauma and Dissociation, 3*, 97-109.

- Wright, D. B., Startup, H. M., & Mathews, S. A. (2005). Mood, dissociation, and false memories using the Deese-Roediger-McDermott procedure. *British Journal of Psychology*, 96, 283-293.
- Zoellner, L. A., Foa, E. B., Brigidi, B. D., & Przeworski, A. (2000). Are Trauma Victims Susceptible to "False Memories"? *Journal of Abnormal Psychology*, 109, 517-524.

Appendixes

Appendix I

Informed consent form.



Forespørsel om å deltakelse i forsøket "Sanne og falske minner: Et hukommelsesstudie med innsatte i Ila fengsel"

Pågående forskning ved Psykologisk institutt undersøker forholdet mellom psykologiske dimensjoner (f.eks. depresjon og angst) og hukommelsens pålitelighet. Her presenterer vi et prosjekt med innsatte som deltakere. Det vil bli utført av professor Tim Brennen og masterstudent Hege C. Dybdal ved Psykologisk Institutt, Universitetet i Oslo.

Prosjektets innhold

Dette prosjektet vil innebære mål av hukommelse samt standardiserte norske spørreskjemaer for blant annet depresjon og angst. Hoveddelen av prosjektet vil bestå av at du vil forsøke å lære ordlister, som du deretter vil bli testet for. Listene er såpass lange at det er umulig å huske alle ord, og vi er interessert i å måle feilene som oppstår.

Deltakerne vil bli bedt om å fylle ut fem spørreskjemaer bestående av til sammen ca. 100 spørsmål. Disse spørsmål vil spørre om din egen vurdering av din mentale tilstand og din mentale helse, for eksempel i forhold til om du er engstelig eller trist, og i så fall i hvilken grad det gjelder.

Forsøket er planlagt gjennomført i desember 2006 og januar 2007. Hege C. Dybdal vil stå for testingen, som vil skje individuelt. Prosedyren vil ta ca. 90 minutter per deltaker. Det vil ikke bli nødvendig for deltakerne å oppgi direkte identifiserende opplysninger som navn eller fødselsnummer i forbindelse med testingen. Vi vil imidlertid trenge navn for å sette opp avtaler om testing, men dette vil ikke kobles med data eller lagres på noen måte. Prosjektet vil være avsluttet 3. mai 2007. Datamaterialet vil da anonymiseres ved at det grovkategoriseres.

Forskningsetikk

- Deltakelse skal være frivillig. Det vil det gå minst én uke mellom orientering om prosjektet og eventuell deltakelse. Deltakere vil bli spurt om å signere et samtykkeskjema.
- Deltakerne har rett til å trekke seg når som helst underveis uten å oppgi årsak. Det vil ikke ha noen negative konsekvenser dersom man velger å ikke delta eller trekke seg underveis.
- Testresultater blir behandlet konfidensielt. Prosjektleder Tim Brennen og Hege C. Dybdal er de eneste som vil ha innsyn i de individuelle resultatene fra testingen. Verken ansatte ved Ila fengsel eller noen andre vil få innsyn. Dataene vil oppbevares innelåst i et rom på Psykologisk Institutt.

- d. Hver deltaker vil få anledning, rett etter deltakelse til å stille spørsmål.

Som ved alle forskningsprosjekter, har vi som hensikt å offentliggjøre resultatene i artikler og på konferanser. Vi vil kun legge fram grupperesultater og det vil ikke være mulig å identifisere deltakere fra dette.

Prosjektet er tilrådd av Regional Komité for Medisinsk Forskningsetikk, sør-B, og meldt fra til Personvernombudet for forskning, Norsk Samfunnsvitenskapelig Datatjeneste AS. Kriminalomsorgen region nordøst har godkjent prosjektet.

Deltakere

Til dette prosjektet ønsker vi 40 innsatte som deltakere. Vi vil også rekruttere en kontrollgruppe bestående av menn med samme alder som de som deltar blant de innsatte, og som vil gjennomgå de samme testene.

Det er gjort svært lite forskning på hukommelse blant innsatte, så vi håper dette høres interessant ut for innsatte ved Ila. Vi stiller gjerne opp på Ila og presenterer resultatene for deltakerne, som en takk for hjelpen. Hvis det er ønskelig kan også professor Tim Brennen holde en forelesning for deltakerne om hukommelse og hvordan den kan trenes opp, i så fall til våren. Utover dette, vil det ikke være til direkte gagn for den enkelte å delta.

Med vennlig hilsen

Tim Brennen (kontaktperson) og Hege C. Dybdal

Psykologisk Institutt
PO Boks 1094 Blindern
0317 Oslo

Samtykkeerklæring

Jeg har mottatt skriftlig og muntlig informasjon om dette studiet, og er villig til å delta.

Dato:

Underskrift:

Navn:

(skriv med blokkbokstaver)

Appendix II – background form.**Deltaker kode:****Tid:****Dato:****Rom:**Bakgrunnsinformasjon:**1. Hvor gammel er du? år****2. Hvor lang utdanning har du? år**

(f.eks. sist tatt ungdomsskolen: 9 år, videregående skole: 12 år, 3-årig høyskole- eller universitetsutdanning: 15 år)

3. Har du brukt eller bruker du noe rusmiddel? JA/NEI**Hvis ja, hvilke(t)?****4. Får du noe(n) fast medikament(er)? JA/NEI****Hvis ja, hvilke(t)?**

Appendix III

Studied word lists with critical lures in capital letters on the top of each list.

TRIST	FRUKT	ARBEID	KALDT	SOVE	FOT
alvorlig	plommer	jobb	varmt	trøtt	tå
gråt	grønnsak	penger	snøfnugg	drømme	kroppsdeler
deprimert	appelsin	kontor	vinter	seng	skolisse
matt	syltetøy	fabrikk	iskrystaller	hvile	sparke
ulykkelig	dessert	sysselsetting	våt	dyne	sandaler
nedstemt	banan	lønn	kjølig	sliten	sokker
bedrøvelig	blåbær	fritid	vær	leggetid	jogge
lei	kirsebær	slitsomt	fryse	snorke	ankel
melankolsk	juice	ansvar	frost	mareritt	lukt
håpløs	salat	kolleger	gysning	våkne	fotball
MUSIKK	ELV	VINDU	KONGE	NÅL	LEGE
toner	vann	dør	krone	tråd	sykepleier
noter	strøm	glass	dronning	sy	syk
piano	innsjø	rute	prins	øye	sykehus
sangstemme	mississippi	skygge	harald	skarp	pasient
radio	båter	karm	diktator	spiss	stetoskop
band	svømme	gardiner	slott	stikke	operasjon
melodi	fiskevann	åpent	trone	fingerbøll	klinikk
konsert	flom	hus	monark	høystakk	kur
instrument	bekk	utsikt	sjakk	torn	kontor
rytme	bru	bris	leder	injeksjon	kirurg

Appendix IV – Poster put up in the prison wards.

SANNE og FALSKE MINNER



Vil du delta i et forskningsprosjekt om hukommelsens pålitelighet?

Vi undersøker forholdet mellom hukommelsens pålitelighet og psykologiske dimensjoner (f.eks. depresjon og angst) og ønsker å undersøke dette forholdet med innsatte som deltakere.

Mer informasjon om prosjektet kan du lese i Ila Nytt og/eller få når vi kommer innom avdelingene i slutten av september eller begynnelsen av oktober. Det vil ta ca 2 timer per deltaker.

Med vennlig hilsen

Tim Brennen og Hege C. Dybdal

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